

**Possible significance of the two forms of  
*Phlogophora meticulosa* (LINNAEUS, 1758)**

(Lepidoptera, Noctuidae)

by

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The announcement and description of a new species of *Phlogophora* (SCHADEWALD, 1992) generated much interest and excitement (EITSCHBERGER, 1992, SOKOLOFF, 1993), but the new species, named *Phlogophora lamii*, was destined to be short-lived and has now been relegated to the archives of synonymy (FIBIGER, 1993). SCHADEWALD separated *P. lamii* from *P. meticulosa* partly on the basis of life history characters. *P. lamii*, he claimed, is the resident north European *Phlogophora*, overwintering as a larva, and producing two generations a year. He gave the larval food-plant as *Lamium album* (hence *lamii*), implying that it might be restricted to this plant. The adult moths are easily separated by the scalloped outer edge of the forewing in *lamii* and the unscalloped edge in *meticulosa* (fig. 1). SCHADEWALD found no differences in the male genitalia between *lamii* and *meticulosa*, a finding confirmed for both sexes by FIBIGER (1993) who promptly made *lamii* a synonym of *meticulosa*. Further doubts about the validity of *lamii* are raised by RENNWALD (1995) who finds both types of moth among the offspring of a single female, a result that I can confirm from breeding experiments in England. It seems therefore that there are not two species and that SCHADEWALD was mistaken.

Nevertheless it is certainly possible to separate captured moths into two forms on the basis of scalloped (*lamii*) and unscalloped (*meticulosa*) outer margins to the forewings (fig. 1). This is not a difference associated with age and wear and tear. Perfectly fresh-looking moths with unscalloped wings are quite frequent, and also among bred material, but of course a few old and well-worn *lamii* lose the scalloping and hence resemble *meticulosa*. They have to be ignored in attempts to score the frequency of the two forms in wild-taken samples.

In 1993 and 1994 I operated two mercury vapour moth traps at Long Wittenham, Oxfordshire, England, and scored every *Phlogophora* (except very worn specimens) as having scalloped or unscalloped forewings, as depicted in fig. 1. The result, by month, is given in table 1. As shown, there is a bimodal distribution of numbers of the moth, with peaks in May–June and August–October, which presumably represents two overlapping breeding generations, with a small number of moths earlier (February–April) and later (November). Both scalloped (*lamii*) and unscalloped (*meticulosa*) occur together and fluctuate in a similar way, but as shown unscalloped moths tend to be more frequent later in the year (September–November) and scalloped moths earlier in the year (May–August). I also noticed that almost all *lamii* had the distinctive greenish colouration on the forewings which was almost invariably lacking in *meticulosa*, many of which looked “old” even though in good condition.

*Phlogophora* larvae may be found at Long Wittenham in all months of the year. Almost all moths reared from these larvae are scalloped *lamii*, with just a few unscalloped *meticulosa*, which partly confirms SCHADEWALD’s (1992) view that *lamii* is the North European resident and *meticulosa* the migrant from the south.

Table 1. Monthly frequency of the two forms of *Phlogophora meticulosa* at Long Wittenham, Oxfordshire, England, 1993–94.

|           | <i>meticulosa</i> | <i>lamii</i> | N   |
|-----------|-------------------|--------------|-----|
| February  | 1                 | –            | 1   |
| March     | –                 | –            | –   |
| April     | 1                 | –            | 1   |
| May       | 10                | 11           | 21  |
| June      | 22                | 37           | 59  |
| July      | 8                 | 9            | 17  |
| August    | 48                | 60           | 108 |
| September | 161               | 121          | 282 |
| October   | 92                | 78           | 170 |
| November  | 11                | –            | 11  |
| total     | 354               | 316          | 670 |

I suggest, therefore, that although SCHADEWALD (1992) was in error to divide the two forms of *Phlogophora* into separate species, he has hit upon a phenotypic character that might enable separation of residents from immigrants. This would be extremely valuable in assessing the annual volume of immigration of *P. meticulosa* into northern Europe. I further suggest that high temperature and low humidity trigger the production of unscalped *meticulosa*, but the trigger will tend to act quantitatively rather than qualitatively so that there will almost always be some unscalped *meticulosa* produced in the cooler north, and vice versa. Almost certainly the switch from one to the other will occur in the late larval or early pupal stages, as happens in most environmentally induced phenotypic changes in the Lepidoptera. Controlled temperature experiments could be most revealing.

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Fig. 1. *Phlogophora meticulosa*, showing unscalloped *meticulosa* and scalloped *lamii*, as used to compile table 1.

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